

DRAFT FOR CEOS PLENARY

CEOS WSSD FOLLOW-UP PROGRAMME MODULE 1 WORKSHOP ADDRESSING EDUCATION, TRAINING AND CAPACITY BUILDING, STELLENBOSCH, SOUTH AFRICA, 2-3 OCTOBER 2003

CAPACITY BUILDING PRINCIPLES AND RECOMMENDATIONS

PARTNERSHIP BETWEEN CEOS AND AFRICAN STAKEHOLDERS TO IMPLEMENT EDUCATION, TRAINING AND CAPACITY BUILDING PRIORITIES IN REMOTE SENSING REQUIRED FOR SUSTAINABLE DEVELOPMENT

Preamble

The CEOS WSSD Workshop on Module 1, Education, Training and Capacity Building, held at Stellenbosch, South Africa, from 2-3 October 2003, was designed to identify the key priorities of African institutions in education, training and capacity building for the improved use of and access to remote sensing data in support of sustainable development. The organisers acknowledged the support provided by the CEOS Secretariat, NOAA, UNESCO's IOC GOOS Project, UNESCO's Crosscutting Project on the Applications of Remote Sensing in Africa, EIS-AFRICA, the University of Stellenbosch, the Agricultural Research Council, the CSIR, and other partners in the successful organisation and implementation of the Workshop in partnership with African stakeholders.

The Participants in the Workshop:

Recalling the UN Millennium Development Goals (**Appendix 1**) and the objectives of the New Partnership for Africa's Development (NEPAD);

Recalling, in addition, the Political Declaration and the Plan of Implementation of the WSSD, which recognised the important role of remote sensing in providing information critical for sustainable development, and which urged CEOS Members and Associates to take action in a number of fields where Earth observation technologies play an important role in support of sustainable development (**Appendix 2**);

Noting with appreciation that as a contribution to implementing the recommendations of the WSSD, CEOS Members and Associates have committed themselves to undertake a WSSD Follow-up Program in five Modules, including one focusing on Education, Training and Capacity Building;

Recognising that efficient, effective and widespread use of Earth observation technologies requires appropriate investment in (i) data collection and processing systems, including computing facilities; (ii) communication infrastructures, easy Internet access, and connectivity with high bandwidth; (iii) underpinning administrative and policy structures and institutions; (iv) local expertise (a skilled workforce); and (v) mechanisms for transferring technologies, knowledge, and data;

Recognising that CEOS Members and Associates consider regions with developing economies for maximum efforts and investments in technological infrastructures, data provision and technology transfer in the field of Earth observations.

The Workshop requested that:

- 1- CEOS use appropriate mechanisms to encourage its Members and Associates to make best efforts to fully implement the recommendations of this Workshop;
- 2- CEOS communicate these recommendations and principles to the ad hoc intergovernmental Group on Earth Observations' (GEO) Subgroup on Capacity Building;
- 3- The South African Government, as the host for the WSSD (Johannesburg, August-September 2002), and the co-host of the first CEOS WSSD Follow up Workshop on Education, Training and Capacity Building (Stellenbosch, October 2003), convey the recommendations of this workshop to the Secretariats of the NEPAD/African Union and the United Nations in New York to obtain their support;
- 4- The relevant African technical institutions and networks create follow-up mechanisms that will work closely with the CEOS Secretariat for full implementation of the workshop recommendations;
- 5- The relevant United Nations agencies, including UNOOSA, UNESCO, IOC of UNESCO, UNEP, UN/ECA, WMO and FAO, (i) integrate these recommendations into their respective capacity building programs; and (ii) provide additional support for full implementation;

The following recommendations will be disseminated at the GOOS-AFRICA workshop (Johannesburg, 24-27 October 2003) in support of the case for the proposal to NEPAD for a Regional Ocean Forecasting System for Africa (ROOFS-AFRICA). The recommendations will also be used to guide the further development of UNESCO's Cross Cutting Project on Remote Sensing for Water Resources and Ecosystems in Africa. The recommendations will also be employed in the future development and implementation of the IOC's recently adopted Strategy for Remote Sensing for Sustainable Development.

The Workshop adopted the following list of Principles and Recommendations:

This draft text, developed by the CEOS Workshop on Education, Training, and Capacity building in Stellenbosch, South Africa on 2-3 October 2003, will be considered by the CEOS Plenary in November 2003 for approval and implementation in the manner to be decided by the Plenary. The Principles were conceived to be broad capacity building guidelines that CEOS could use to shape its sustainable development activities anywhere in the world. The Recommendations provide a specific Africa context for future CEOS efforts on the continent.

PRINCIPLES

1. As CEOS, through its Members and Associates, undertakes activities promoting sustainable development-oriented activities which include capacity building components, it should remember to acknowledge social, economic, and environmental applications that address locally-defined data and information needs, and take steps to promote access to data and information for sustainable development.
2. By linking space agency resources (which are, at minimum, access to remote sensing expertise and education materials) to locally-defined needs, CEOS should promote the utilization of satellite information through training and education, provision of data and information, and/or partnerships with users.
3. To support sustainable development, CEOS should build long-term and sustainable partnerships through its Members and Associates with relevant organizations and institutions, notably, universities, specialized and professional remote-sensing organizations, and government and non-governmental organizations.
4. Through its unique and high-level membership, CEOS should assist local organizations to raise awareness of the importance of Earth observation data and information with their key local and governmental decision makers.
5. CEOS' capacity-building efforts should build on existing local programs, and engage existing organizations, always recognizing local capacity (e.g., in terms of expertise, communications infrastructure, and other resources) and respecting indigenous knowledge and local priorities.
6. Understanding that CEOS is not the only space-oriented organization interested in supporting capacity building efforts for sustainable development, CEOS should avoid duplication of effort by coordinating its activities with like-minded groups.
7. CEOS Members and Associates should appropriately model capacity building by encouraging – and when necessary financially supporting – involvement of developing country representatives in WSSD Follow-up Programme activities, and by participating in and supporting relevant forums and events.
8. CEOS' short-term and long-term education, training, and capacity building efforts should be complementary, comprehensive, and measurable to be valued and further supported by the CEOS membership.

RECOMMENDATIONS

1. CEOS should encourage the formation of concrete partnerships between CEOS Members and Associates and relevant African institutions for education, training and capacity building in support of the WSSD Follow-up Programme. These partnerships should center on issues including water resource management, disaster and conflicts, climate change, and land use monitoring and GIS, while building upon existing programmes and taking advantage of new satellite (e.g. higher resolution) data.

- 2 CEOS should take advantage of the African Advisory Group that has been formed by stakeholders, including EIS-Africa, African Association of Remote Sensing for Environment (AARSE), and other appropriate organizations (**Appendix 3**), to assist the CEOS ad hoc Working Group on Education and Training (WGEdU) and the CEOS WSSD Follow-up Programme to ensure that top African priorities are addressed in their efforts.
- 3 Progress and effectiveness should be measured by the CEOS ad hoc Working Group on Education and Training (WGEdU) and the African Advisory Group bi-annually and be reported back to CEOS, NEPAD and other key stakeholders.
- 4 CEOS should facilitate access to current high-resolution data sets for specific key needs (e.g. food security, public health, poverty alleviation, disaster management, ocean forecasting, water and sanitation, the development of applications of satellite and other data having significant socio-economic benefit in Africa) by organisations such as universities, regional centres and specialised agencies. The CEOS WGEdU **Draft** Resolution on Satellite Data Provision (**Appendix 4**) should play a key role in this process.
- 5 CEOS should work in partnership with relevant African institutes to assist in the development of key applications, also to raise awareness and commitment in Africa at high levels within governments and organizations.
- 6 CEOS should consider supporting workshops in 2004:
 - i. On the beneficial applications of remotely sensed data for high level decision makers, e.g. at the African Ministerial Conference on the Environment (AMCEN) and the African Ministerial Conference on Water (AMCOW);
 - ii. On the technical aspects of the use of satellite data, e.g. at the African Association for Remote Sensing of the Environment Conference (AARSE) in October 2004 in Nairobi.
 - iii. On the application of satellite data for coastal developing nations, e.g. at the GOOS Africa Workshop on Education and Training in Marine Science and Satellite Oceanography in late 2004.
 - iv. On linking capacity building in earth observation to Africa's larger sustainable development goals, e.g. at the African Union/NEPAD ministerial conferences in 2004.

Appendix 5 includes other workshop opportunities to support identified by the African Advisory Group.

- 7 CEOS should facilitate a greater understanding and use of publicly available data and open source software, so that value added products can be developed for practical applications and operations responding to local, national and regional requirements.

- 8 CEOS Members and Associates should support University partnerships, e.g. arrangements between CEOS Member countries and African countries.
- 9 CEOS Members should raise awareness and notify of availability of existing archived data and products, and make education and training resource portals of available satellite data and information readily available to African users. CEOS Members and Associates should support initiatives that will lead to the establishment of a regional Earth Observation Data Centre (EODC) in Africa.
- 10 CEOS Members and Associates should engage with the Africa Environment Information Network (AEIN) framework, and similar initiatives such as the Environmental Long-Term Observatories Network of Southern Africa (ELTOSA), and support their implementation, e.g. by sharing of relevant data with participating agencies and countries.
- 11 CEOS should take steps to minimise barriers to accessing satellite data in Africa
- 12 CEOS should work in partnership with organisations such as EIS Africa, Economic Commission for Africa (ECA), AARSE, and similar organisations to support networking in satellite remote sensing applications.
- 13 CEOS should raise the awareness of donor communities on the benefits of the use of remotely sensed data and applications, particularly in developing nations in support of sustainable development goals.

APPENDIX 1

UN Millennium Development Goals

The global challenge: Goals and targets

The Millennium Development Goals are an ambitious agenda for reducing poverty and improving lives that world leaders agreed on at the Millennium Summit in September 2000. For each goal one or more targets have been set, most for 2015, using 1990 as a benchmark:

1. Eradicate extreme poverty and hunger

Target for 2015: Halve the proportion of people living on less than a dollar a day and those who suffer from hunger.

More than a billion people still live on less than US\$1 a day: sub-Saharan Africa, Latin America and the Caribbean, and parts of Europe and Central Asia are falling short of the poverty target.

2. Achieve universal primary education

Target for 2015: Ensure that all boys and girls complete primary school.

As many as 113 million children do not attend school, but the target is within reach. India, for example, should have 95 percent of its children in school by 2005.

3. Promote gender equality and empower women

Targets for 2005 and 2015: Eliminate gender disparities in primary and secondary education preferably by 2005, and at all levels by 2015.

Two-thirds of illiterates are women, and the rate of employment among women is two-thirds that of men. The proportion of seats in parliaments held by women is increasing, reaching about one third in Argentina, Mozambique and South Africa.

4. Reduce child mortality

Target for 2015: Reduce by two thirds the mortality rate among children under five

Every year nearly 11 million young children die before their fifth birthday, mainly from preventable illnesses, but that number is down from 15 million in 1980.

5. Improve maternal health

Target for 2015: Reduce by three-quarters the ratio of women dying in childbirth.

In the developing world, the risk of dying in childbirth is one in 48, but virtually all countries now have safe motherhood programmes.

6. Combat HIV/AIDS, malaria and other diseases

Target for 2015: Halt and begin to reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.

Forty million people are living with HIV, including five million newly infected in 2001. Countries like Brazil, Senegal, Thailand and Uganda have shown that the spread of HIV can be stemmed.

7. Ensure environmental sustainability

Targets:

- *Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.*
- *By 2015, reduce by half the proportion of people without access to safe drinking water.*
- *By 2020 achieve significant improvement in the lives of at least 100 million slum dwellers.*

More than one billion people lack access to safe drinking water and more than two billion lack sanitation. During the 1990s, however, nearly one billion people gained access to safe water and the same number to sanitation.

8. Develop a global partnership for development

Targets:

- *Develop further an open trading and financial system that includes a commitment to good governance, development and poverty reduction – nationally and internationally*
- *Address the least developed countries' special needs, and the special needs of landlocked and small island developing States*
- *Deal comprehensively with developing countries' debt problems*
- *Develop decent and productive work for youth*
- *In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries*
- *In cooperation with the private sector, make available the benefits of new technologies – especially information and communications technologies.*

APPENDIX 2

World Summit on Sustainable Development Plan of Implementation References to Earth Observation

IV. Protecting and managing the natural resource base of economic and social development

27. Improve water resource management and scientific understanding of the water cycle through cooperation in joint observation and research, and for this purpose encourage and promote knowledge-sharing and provide capacity-building and the transfer of technology, as mutually agreed, including remote-sensing and satellite technologies, particularly to developing countries and countries with economies in transition.

* * *

35. An integrated, multi-hazard, inclusive approach to address vulnerability, risk assessment and disaster management, including prevention, mitigation, preparedness, response and recovery, is an essential element of a safer world in the twenty-first century. Actions are required at all levels to:

....

(c) Strengthen the institutional capacities of countries and promote international joint observation and research, through improved surface-based monitoring and increased use of satellite data, dissemination of technical and scientific knowledge, and the provision of assistance to vulnerable countries;

* * *

36. Change in the Earth's climate and its adverse effects are a common concern of humankind. We remain deeply concerned that all countries, particularly developing countries including the least developed countries and small island developing States, face increased risks of negative impacts of climate change and recognize that, in this context, the problems of poverty, land degradation, access to water and food and human health remain at the centre of global attention. The United Nations Framework Convention on Climate Change is the key instrument for addressing climate change, a global concern, and we reaffirm our commitment to achieving its ultimate objective of stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner, in accordance with our common but differentiated responsibilities and respective capabilities. Recalling the United Nations Millennium Declaration, in which heads of State and Government resolved to make every effort to ensure the entry into force of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, preferably by the tenth anniversary of the United Nations Conference on Environment and Development in 2002, and to embark on the required reduction of emissions of greenhouse gases, States that have ratified the Kyoto Protocol strongly urge States that have not already done so to ratify the Kyoto Protocol in a timely manner. Actions at all levels are required to:

.....

(g) Promote the systematic observation of the Earth's atmosphere, land and oceans by improving monitoring stations, increasing the use of satellites, and appropriate

integration of these observations to produce high-quality data that could be disseminated for the use of all countries, in particular developing countries;

(h) Enhance the implementation of national, regional and international strategies to monitor the Earth's atmosphere, land and oceans including, as appropriate, strategies for integrated global observations, inter alia with the cooperation of relevant international organisations, especially the United Nations specialized agencies in cooperation with the UNFCCC;

VIII. Sustainable development for Africa

59. Deal effectively with natural disasters and conflicts, including their humanitarian and environmental impacts, recognizing that conflicts in Africa have hindered and in many cases obliterated both the gains and efforts aimed at sustainable development, with the most vulnerable members of society, particularly women and children, being the most impacted victims, through efforts and initiatives, at all levels, to:

(a) Provide financial and technical assistance to strengthen the capacities of African countries, including institutional and human capacity, including at the local level, for effective disaster management, including observation and early warning systems, assessments, prevention, preparedness, response and recovery;

IX. Means of implementation*

104. Assist developing countries, through international cooperation, in enhancing their capacity in their efforts to address issues pertaining to environmental protection including in their formulation and implementation of policies for environmental management and protection, including through urgent actions at all levels to:

....

(b) Promote and, where appropriate, improve their use of satellite technologies for quality data collection, verification and updating, and further improvement of aerial and ground-based observations, in support of their efforts to collect quality, accurate, long-term, consistent and reliable data;

* * *

119.septies Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land-use changes, including through urgent actions at all levels to:

(a) Strengthen cooperation and coordination among global observing systems and research programmes for integrated global observations, taking into account the need for building capacity and sharing of data from ground-based observations, satellite remote sensing and other sources among all countries;

(b) Develop information systems that make the sharing of valuable data possible, including the active exchange of Earth observation data;

(c) Encourage initiatives and partnerships for global mapping.

* Because the structure of chapter IX was changed in the course of negotiations, so that its paragraph numbering no longer corresponds to the earlier version contained in document A/CONF.199/L.1, Latin ordinal numbers (bis, ter etc.) are used after paragraph 119 until the end of the chapter in order not to disrupt the paragraph numbering of the following chapter, which was not so changed.

119.octies Support countries, particularly developing countries, in their national efforts to:

....

(b) Use satellite and remote-sensing technologies for data collection and further improvement of ground-based observations;

(c) Access, explore and use geographic information by utilizing the technologies of satellite remote sensing, satellite global positioning, mapping and geographic information systems.

119.noviens Support efforts to prevent and mitigate the impacts of natural disasters, including through urgent actions at all levels to:

....

(b) Translate available data, particularly from global meteorological observation systems, into timely and useful products.

APPENDIX 3

African Advisor Group to CEOS Ad-hoc Working Group on Education and Training and the CEOS WSSD Follow-up Programme

DRAFT TERMS OF REFERENCE

AFRICAN ADVISORY GROUP

1. Background:

The African Advisory Group (AAG) was formulated on a voluntary basis during the 1st CEOS Education, Training and Capacity Building Workshop held in Stellenbosch, South Africa from 2-3 October 2003.

2. Purpose:

- AAG was established to work closely with the Committee on Earth Observation Satellites (CEOS) during formulation and implementation of the capacity building principles and recommendations that were an outcome of the Stellenbosch capacity building workshop.
- AAG to provide advisory support to the CEOS in identifying meteorological, research and development priority areas that are relevant to the African continent where education, training and capacity building in remote sensing and GIS technologies contribute effectively towards solving sustainable development challenges
- AAG to work towards a coherent use of GIS and remote sensing technologies for the economic development of the African continent by creating, in collaboration with the CEOS, more education, training and capacity building opportunities for African institutions
- AAG to make sure that education, training and capacity building is prominently integrated during implementation of the other CEOS WSSD Follow-up Programme Modules - measuring the progress of these efforts on an annual basis
- AAG to mobilize necessary support that will tap into the flow of funds and other resources towards suitable projects
- AAG to supplement and compliment efforts in the African continent by striving to build synergies between existing and new initiatives, and to promote partnerships that will leverage resources
- AAG to work closely with tertiary educational institutes in order to stimulate interest in remote sensing and GIS capacity building
- AAG to influence curriculum development in individual countries to recognise GIS as an enabling module for dealing with sustainable development challenges

- AAG to encourage youth participation in the GIS field
- AAG to implement awareness programmes targeting decision making stakeholders in individual countries

3. Convenor/Secretariat:

The Council for Scientific and Industrial Research (CSIR-South Africa) will play the roles of Convener and Secretariat and closely supported by EIS-AFRICA.

4. Membership:

Include African organisations/institutions or those organisations that are undertaking relevant meteorological, research and development work in the African continent.

Below is a list of all participating individuals in the African Advisory Group:

Name of representative	E-mail	Name of institution	Country
Mr Charles-Elie MBONGUY-DOUMAMBILA	cdoumambila@adie-prgie.org	International Agency for Environmental Information Development (ADIE)	GABON
Mr Enias CHINJEKURE	echinjekure@dsg.co.zw	Department of The Surveyor-General (DSG)	ZIMBABWE
Mr Justin AHANHANZO	j.ahanhanzo@unesco.org	UNESCO: Intergovernmental Oceanographic Commission	FRANCE
Professor Geoff BRUNDRIT	elley@ocean.uct.ac.za	University of Cape Town	SOUTH AFRICA
Mr André BASSOLÉ	abassole@fasonet.bf	EIS -AFRICA	BURKINA FASO
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Ms Christine HUTTON	chris.hutton@ccrs.nrcan.gc.ca	Canada Centre for Remote Sensing (CCRS)	CANADA
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Dr Anthony PALMER	t.palmer@ru.ac.za	Agricultural Research Centre: Range and Forage Institute (ARC)	SOUTH AFRICA
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Dr Patrick KARANI	pkarani@beainternational.org	Bureau of Environmental Analysis (BEA International)	KENYA
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Mr Conrad SEBEGO	csebego@csir.co.za	Council for Scientific and Industrial Research (CSIR)	SOUTH AFRICA

Ms. Lufuno TSHIKALANGE	lufuno@ananzi.co.za	Presidential National Commission- Information Society & Development	SOUTH AFRICA
Mr Chris AMBALA	chris.ambala@unep.org	UNEP Division of Early Warning Africa (DEWA)	KENYA

5. Undertaking:

The African Advisory Group undertakes to assist CEOS Working Group on Education, and Training; as well as the CEOS WSSD Follow -up Programme with identifying relevant projects in the African continent where satellite remote sensing and GIS technologies will be applicable.

APPENDIX 4

CEOS Ad-hoc Working Group on Education and Training Draft Earth Observation Education and Training Data Principles

Resolution on Principles of Satellite Data Provision

***In Support of* Earth Observation Education and Training**

RECALLING the CEOS Strategy for Earth Observation Training and Education, adopted by the 15th Plenary in Kyoto, Japan, in 2001, which states:

“The CEOS strategy for Earth observation education and training is to establish an effective coordination and partnership mechanism among CEOS agencies and institutions offering education and training around the world. The key objective of the strategy is to facilitate activities that substantially enhance international education and training in Earth observation techniques, data analysis, interpretation, use and application.”

RECOGNIZING that the needs of education and training, particularly in developing countries, provides unique requirements with regard to earth observation data availability and provision potentially not addressed elsewhere;

AWARE that value added companies develop training materials and are most often the organizations to make remote sensing data useful to people not non specialists and, therefore, have rights associated with intellectual property which must be respected;

AFFIRMING that CEOS agencies do have an important role to play in educating the next generation of Earth observation scientists, trainers and other users of Earth observation data, such as local, regional and international policy-makers, the media, and citizens at large;

EMPHASIZING that coordinating education-related activities within the user community, such as through the CEOS WGEdu and the CEOS WSSD follow-up Programme, will prove fundamental in the realisation of one of CEOS's ultimate goals: maximizing the utilisation of, and benefit from, Earth observation data.

THEREFORE:

CEOS agencies commit to the following set of principles on data provision in support of Earth observation education, and training and will implement them to the fullest extent possible, within available resources and consistent with agency data policies:

- 1) CEOS agencies should endeavour to provide on a sustainable basis comprehensive and complete data sets for education and training purposes.

- 2) When making data available for education and training purposes CEOS agencies should strive to adhere to the satellite data exchange principles in support of global change research (1992) and principles on satellite data provision in support of operational environmental use for the public benefit (1994) as previously adopted by CEOS.
- 3) CEOS agencies should provide access to data at the lowest possible cost and on a non-discriminatory basis.
- 4) CEOS agencies should provide easy and timely access to their data and information which are to be used for Earth observation education and training. This access can be through individual agencies' distribution mechanisms or through mechanisms developed by CEOS, such as WSSD follow-up Programme.

APPENDIX 5

Remote Sensing & GIS Conferences/Seminars/Workshops of Particular Interest to the African Advisory Group

Name of event	Date	Country	Name of person attending the event
GOOS-Africa	27-30 Oct 2003	Johannesburg, South Africa	
NEPAD Ministerial Conference on Science and Technology for Development	3-7 November 2003	Johannesburg, South Africa	
Use of available Global Landsat datasets to meet the information needs of NEPAD	3 Nov 2003	Dakar, Senegal	
Africa-GIS	4-7 Nov 2003	Dakar, Senegal	
Zimbabwe SDI Workshop	11-13 Nov 2003	Harare, Zimbabwe	
17 th CEOS Plenary	19-20 Nov 2003	Colorado, USA	
Geoinformation Society of Nigeria -1 st Annual General Assembly	26-28 Nov 2003	Abuja, Nigeria	
2 nd GEO meeting	28-29 Nov 2003	Italy	
7 th Global Spatial Data Infrastructure Conference	2-6 Feb 2004	Bangalore, India	
5 th African Association of Remote Sensing of the Environment	18-21 Oct 2004	Nairobi, Kenya	